The endogenous progenitor response following traumatic brain injury: a target for cell therapy paradigms.

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Authors: Anna Badner, Brian J Cummings

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Public Summary:
Although there is ample evidence that central nervous system progenitor pools respond to traumatic brain injury, the reported effects are variable and likely contribute to both recovery as well as pathophysiology. Through a better understanding of the diverse progenitor populations in the adult brain and their niche-specific reactions to traumatic insult, treatments can be tailored to enhance the benefits and dampen the deleterious effects of this response. This review provides an overview of endogenous precursors, the associated effects on cognitive recovery, and the potential of exogenous cell therapeutics to modulate these endogenous repair mechanisms. Beyond the hippocampal dentate gyrus and subventricular zone of the lateral ventricles, more recently identified sites of adult neurogenesis, the meninges, as well as circumventricular organs, are also discussed as targets for endogenous repair. Importantly, this review highlights that progenitor proliferation alone is no longer a meaningful outcome and studies must strive to better characterize precursor spatial localization, transcriptional profile, morphology, and functional synaptic integration. With improved insight and a more targeted approach, the stimulation of endogenous neurogenesis remains a promising strategy for recovery following traumatic brain injury.

Scientific Abstract:
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